DOCUMENT RESUME

ED 309 209 UD 026 863

AUTHOR Issa, Raja R. A.; Lorentz, Robert L.
TITLE Variations in Anxiety/Attitudes of Black High School Teachers towards Computers.
PUB DATE Feb 89
NOTE 19p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Black Teachers; *Computer Literacy; Computers; *Computer Uses in Education; High Schools; Multivariate Analysis; Questionnaires; *Secondary School Teachers; *Teacher Attitudes

ABSTRACT

This study examines differences in attitudes and anxiety levels toward computers between a group of black high school teachers who had regular exposure to computers (Group II) and a group of who had little or no exposure (Group I). Forty teachers from several Mississippi Delta high schools responded to a questionnaire containing demographic and attitudinal questions. Chi square statistics were examined to determine the independence between the variables of Group I and Group II. Multiple discriminant analysis was performed to determine statistical differences between the two groups. Analysis of the attitudinal variables showed marked differences between the two groups in their beliefs that computers are difficult to use, that computers are complicated machines, and that they lacked understanding of the many applications of computers. Both groups disagreed with the statement that it was more troublesome to do something on the computer than by hand. Discriminant functions correctly classified group membership at a level far beyond the chance level at 50 percent. Statistical data are included on five tables. A copy of the "Microcomputer Seminar Attitudes Survey" questionnaire and a seven-item bibliography are appended. (FMW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

6/14/89

ED309209

Variations in Anxiety/Attitudes of Black Highschool Teachers Towards Computers

by

Raja R. A. Issa
Mississippi Valley State University

Robert L. Lorentz
Mississippi State University

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

R. Raymond Issa
MS Valley State Univ.

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

UD 026 863

BEST COPY AVAILABLE

TABLE OF CONTENTS

INTRODUCTION. 1

METHODOLOGY 2

FINDINGS. 5

CHI SQUARE STATISTICS 5

MULTIPLE DISCRIMINANT ANALYSIS 7

DISCUSSION OF RESULTS. 9

Recommendations for future research 9

APPENDIX A
QUESTIONNAIRE 12

END NOTES 15

BIBLIOGRAPHY. 16

LIST OF ILLUSTRATIONS

QUESTIONNAIRE 12

LIST OF TABLES

Table

1. Demographics of the Groups involved in the Study 3

2. Attitudinal Descriptive Statistics. 4

3. Acceptance or Rejection of the Hypothesis that for a Given Variable the Exposure and Non-Exposure Groups are Independent 6

4. Linear Discriminant Functions 8

5. Classification into a priori Groups using the two Discriminant Functions Described in TABLE 4. 8

INTRODUCTION

With the proliferation of personal computers in the home and in the workplace, there is an ever increasing demand for the integration of computers into the curricula of both secondary schools and institutions of higher learning. All to often, the approach taken to satisfying such demands involves the training of the current staff of educators in the use of personal computers as a teaching tool and as a research and administrative tool. Studies have indicated that teachers receiving instruction in the use of computers have a higher level of anxiety than students [1].

The anxiety experienced by educators has been mainly attributed to a generalized fear of technology and the fear generated when one is being affected by events one cannot control [2]. One study found that exposure to the use of computers can cause a significant decrease in anxiety [3]. A second study found that a one semester course in the practical use of computers caused an increase in anxiety among black educators [4]. One way to measure such anxiety is to look for possible changes in attitude brought on by continuous exposure to the computer in an educational setting.

The purpose of the current study is to study the differences in attitude and anxiety levels between black highschool teachers with "regular" exposure to computers (Group II) and black highschool teachers without such exposure (Group I). For the purposes of this paper, regular exposure to computers is being defined as a minimum of one hour or more daily use of the computer.

METHODOLOGY

The data for this study were collected from several area highschools in the Mississippi Delta over a one semester period. All highschool teachers participating in the study were black. Of the Group II participants (n = 20) in the survey, nine (45%) were females and eleven (55%) were males, while the number of educational degrees was evenly distributed between ten bachelors (50%) and ten masters (50%) degree holders. Group I (n = 20) was composed of fourteen females (70%) and six males (30%), while the number of educational degrees was distributed between seven bachelors (35%) and thirteen (65%) degree masters degree holders. Details of the descriptive information collected on the sample are shown in Table 1.

For the purpose of this study a questionnaire was administered to the participants in both groups (see Appendix A). Included in the questionnaire were seven demographic questions: (1) sex, (2) age, (3) education, (4) area of

TABLE 1

Demographics of the Groups Involved in the Study

	Group I No Exposure (n = 20)		Group II Exposure (n = 20)	
	N	%	N	%
Sex				
Females	14	70	9	45
Males	6	30	11	55
Age				
25 - 35	9	45	4	20
36 - 49	10	50	16	80
OVER 50	1	5	0	0
Education				
Doctorates	0	0	0	0
Masters	13	35	10	50
Bachelors	7	65	10	50
Really Used a Computer				
Yes	0	0	20	100
No	20	100	0	0
Previous Course in Computers				
Yes	0	0	14	70
No	20	100	6	30
Ownership or Regular Access to a Computer				
Yes	4	20	9	45
No	16	80	11	55

Source: Original using Microstat statistical package.

specialization, (5) previous use of a computer, (6) previous course in computers, and (7) ownership or regular access to a computer. In line with the purpose of the study (to measure anxiety and attitudinal differences toward computers), twelve attitude questions were included. Questions number 5, 6, and 13 were reverse coded so that high response numbers would indicate negative attitudes toward computers. For descriptive group statistics on the twelve attitudinal questions see Table 2.

TABLE 2

Attitudinal Descriptive Group Statistics

	Group I No Exposure (n = 20)		Group II Exposure (n = 20)	
VARS.	MEAN	STD. DEV	MEAN	STD. DEV
1	2.9000	1.2096	3.7000	1.2183
2	2.7000	1.4179	3.3500	1.1821
3	3.2500	1.1642	3.3000	1.3018
5	3.9500	1.2344	3.9000	1.1192
6	2.5500	1.3945	2.1500	1.1821
7	3.4000	1.4654	4.2500	.7164
8	3.8500	1.0400	4.1500	1.0894
9	4.3000	.9787	4.1000	1.1653
10	3.8000	1.0563	3.6500	1.3485
11	3.1500	1.3089	3.8500	1.0894
12	2.8000	1.1965	2.1000	1.2524
13	2.3000	1.1743	3.5500	1.2344

*Variables 1 trough 13 correspond to attitudinal questions 1 through 13 in the questionnaire (see appendix A)

Source: Original using Microstat statistical package.

Chi square statistics were examined to determine the independence between the variables of Group I and Group II.

For those variables in which the computed chi-square value was greater than the tabular chi-square value, the hypothesis that there is not a significant difference between data sets was rejected. Multiple discriminant analysis was performed to determine whether or not statistical difference could be found between Group I and Group II. A discriminant equation was derived that maximized between-group differences and minimized within-group differences. When the discriminant equation successfully classifies 25 percent more of the subjects into the correct group than would have been correctly classified by chance alone, then the variables are considered good predictors of group membership [5].

FINDINGS

CHI SQUARE STATISTICS

An examination of the Chi Square statistics as reported in Table 3, indicates independence between the two groups in the following attitudes:

1. Computers are difficult to use.
2. Computers are complicated machines.
3. It is more troublesome to do something on the computer than by hand.
4. Information received from computers is never wrong.
5. Using a computer is very stressful, i.e. frustrating.
6. I have a good understanding of the many applications possible with a computer.

TABLE 3

Acceptance or Rejection of the Hypothesis that for a Given Variable the Exposure and Non-Exposure groups are Independent

Variables**	Computed X^2	Tabulated X^2 (@ =0.1)	p-value
1 (Difficult to use)	8.307	7.78	0.0810
2 (complicated machines)	8.376	7.78	0.0787
3 (easily damaged by user)	7.543	7.78	0.1098
4 (access to computers)	6.429	7.78	0.1693
5 (improve productivity)	1.060	7.78	0.9006
6 (plan to purchase)	1.410	7.78	0.8424
7 (fear computer may replace me)	7.429	7.78	0.1149
8 (computers make mistakes)	5.847	7.78	0.2109
9 (computer is troublesome)	11.569	7.78	0.0209
10 (computer is never wrong)	8.119	7.78	0.0873
11 (computer use is stressful)	9.351	4.61	0.0093
12 (need understand how it works)	4.701	7.78	0.3194
13 (understand possible uses)	16.511	7.78	0.0024
14 (sex)	2.558	2.71	0.1098

Table 3--Continued

15 (age)	4.308	4.61	0.1160
16 (degree)	0.921	2.71	0.3373
17 (field of study)	0.234	4.61	0.8894
19 (ever taken computer course)	21.538	2.71	3.468E-06

Source: Original using Microstat statistical package.

**Variable names have been abbrieviated, for full variable names see Appendix A.

MULTIPLE DISCRIMINANT ANALYSIS

Attitudinal questions one through twelve (1-12) were used in the discriminant equation. Table 4 provides the discriminant score for each group as follows: the discriminant score for group one equaled the constant ± weight one times variable 1 . . . ± weigth twelve times variable 12, or (-59.34 + .68 variable 1 . . . 3.73 variable 12 (To use a computer one must have a good understanding of how it works internally).

When the two discriminant functions were used to classify the subjects in this study into two a priori defined groups, 80 percent of the cases were classified correctly, as shown in Table 5. The discriminant functions classified 18 of the 20 members (90.0 %) in group I correctly, and 18 of 20 members (90.0%) in group II correctly.

TABLE 4

Linear Discriminant Functions

Classification Variable: Exposure to a Computer

	Group I No Exposure	Group II Exposure
Constant	-59.33894	-61.01291
V-1	.6802529	- .7574011
V-2	4.472909	5.028509
V-3	4.50171	3.757317
V-4	8.874142	8.876806
V-5	7.954136	8.49652
V-6	.3816605	1.170253
V-7	7.347797	6.035013
V-8	7.758809	7.549369
V-9	-6.229559	-4.982414
V-10	- .687925	.3231918
V-11	-4.217737	-4.976201
V-12	3.729869	4.834728

Source: Original using NCSS statistical package.

TABLE 5

Classification into A_priori Groups Using the two Discriminant Functions Described in Table 4.

		PREDICTED GROUP MEMBERSHIP	
ACTUAL GROUP	NO. OF CASES	I	II
Group I	20	18	2
Group II	20	2	18

Percent of "grouped" cases correctly classified: 80.0%

Source: Original using NCSS statistical package.

DISCUSSION OF RESULTS

Two major findings emerged from this study. First, the analysis of the attitudinal variables showed marked differences among the exposure and no exposure groups. Differences among those who had exposure included reversal from the no exposure groups' believe that computers are difficult to use, that computers are complicated machines, and the lack of understanding of the many applications possible with a computer. Both groups disagreed with the statement that it is more troublesome to do something on the computer than by hand, with the no exposure group disagreeing to a slighlty greater (4.3 vs. 4.1) yet statistically significant amount. No exposure educators did indicate increased levels of anxiety towards computers as shown in questions 11 (Using computers is very stressful, i.e. frustrating), and 13 (I have a good understanding of the many applications possible with a computer). Second, discriminant functions did discriminate differences between a priori defined groups. The discriminant functions correctly classified group membership at a level much beyond the chance level of 50 percent. Ninety percent of the "exposure" and "no exposure" group members have been correctly classified.

Recommendations for future research.

No individual study provides the definitive answer to any research question. The findings in this study will take

on additional meaning with replications and extensions.

Therefore, recommendations for future research are as follows:

1. Replication of the study should be made with the following modifications:

   a. the groups should be proportionately stratified random samples, thus overcoming the shortfall of the non-homogeneous structure of the exposure and no exposure groups in the present study.

   b. the number of group members should be enlarged to reduce the non-random assignment of highschool teachers in both groups.

   c. a larger population sample would provide a larger data base for additional statistical analysis.

   d. the study should be extended to other sub-cultural groups, including but not limited to, Hispanics and Orientals.

   e. extension of the study should be made to a comparison of teachers to students and staff members.

As this study indicates, both attitudes and anxiety levels of black educators toward computers can be expected to improve with regular exposure to computers.

APPENDIX A

QUESTIONNAIRE

CS 403 MICROCOMPUTER SEMINAR ATTITUDES SURVEY

The following are 6 questions about you. Please put an X beside the answer that is true for you. There are no right or wrong answers, but only what is true for you.

PLEASE ANSWER EVERY ONE OF THE FOLLOWING QUESTIONS

Place an X beside the answer which is true for you.

1. SEX:

____MALE
____FEMALE

2. AGE:

____UP TO 25 YEARS
____25 YEARS TO 35 YEARS
____36 YEARS TO 49 YEARS
____50 YEARS OR OLDER

3. EDUCATION:

____Ph.D
____DBA
____Ed.D
____MS
____MBA
____MA
____M.Ed.
____BS
____B. Bus. Ad.
____BA
____OTHER. EXPLAIN _____
_____

4. AREA(S) OF SPECIALIZATION

____BUSINESS
____EDUCATION
____ENGINEERING
____COMPUTER SC.
____NATURAL SCIENCES
____PHYSICAL SCIENCES
____SOCIAL SCIENCES
____FINE ARTS
____OTHER, EXPLAIN_____
_____

5. HAVE YOU EVER REALLY USED A COMPUTER. ___YES___NO

6. HAVE YOU EVER TAKEN A COURSE ON COMPUTERS. ___YES___NO

PLEASE TURN PAGE

Questionnaire--Continued

Following are 13 statements about computers. Please circle the number that shows the extent to which you agree or disagree with each statement.

1. means you STRONGLY AGREE with this statement.

2. means you AGREE with the statement.

3. means you HAVE NO OPINION on the statement.

4. means you DISAGREE with the statement.

5. means you STRONGLY DISAGREE with the statement.

EXAMPLE:

COMPUTERS ARE CHEAP. 1 2 3 4 5

If you STRONGLY AGREE with this statement you would circle the number 1 like this:
COMPUTERS ARE CHEAP. (1) 2 3 4 5

If you AGREE with this statement you would circle the number 2, like this:
COMPUTERS ARE CHEAP. 1 (2) 3 4 5

If you HAVE NO OPINION on this statement you would circle the number 3, like this:

COMPUTERS ARE CHEAP. 1 2 (3) 4 5

If you DISAGREE with this statement you would circle the number 4, like this:
COMPUTERS ARE CHEAP. 1 2 3 (4) 5

If you STRONGLY DISAGREE with this statement you would circle the number 5, like this:
COMPUTERS ARE CHEAP. 1 2 3 4 (5)

Following are more statements like the above example. Start with number 1 and circle the number that best shows how you feel about the statement. Please keep these three things in mind:

PLEASE TURN PAGE

Questionnaire--Continued

A. Give only true answers about what you think. It will help us more if you circle what you really think.

B. You may have as much time as you need, but go fairly fast. Give the first answer that comes to you and do not spend too much time on any statement.

C. Do not skip any statements. CIRCLE EVERY STATEMENT ONE OF THE FIVE WAYS !

1.	COMPUTERS ARE DIFFICULT TO USE.	1	2	3	4	5
2.	COMPUTERS ARE COMPLICATED MACHINES.	1	2	3	4	5
3.	COMPUTERS ARE EASILY DAMAGED BY THE USER.	1	2	3	4	5
4.	I OWN OR HAVE REGULAR ACCESS TO A COMPUTER.	1	2	3	4	5
5.	USING COMPUTERS AT WORK WILL IMPROVE MY PRODUCTIVITY.	1	2	3	4	5
6.	I PLAN TO PURCHASE A COMPUTER IN THE NEXT 12 MONTHS.	1	2	3	4	5
7.	I AM AFRAID THE COMPUTER MIGHT REPLACE ME IN MY JOB.	1	2	3	4	5
8.	COMPUTERS MAKE A LOT OF MISTAKES.	1	2	3	4	5
9.	IT IS MORE TROUBLESOME TO DO SOMETHING ON THE COMPUTER THAN BY HAND.	1	2	3	4	5
10.	INFORMATION RECEIVED FROM COMPUTERS IS NEVER WRONG.	1	2	3	4	5
11.	USING A COMPUTER IS VERY STRESSFUL, i.e. FRUSTRATING.	1	2	3	4	5
12.	TO USE A COMPUTER ONE MUST HAVE A GOOD UNDERSTANDING OF HOW IT WORKS INTERNALLY.	1	2	3	4	5
13.	I HAVE A GOOD UNDERSTANDING OF THE MANY APPLICATIONS POSSIBLE WITH A COMPUTER.	1	2	3	4	5

NOTES

1. See M. A. Cambre and D. L. Cooke, "Computer anxiety: Definition, measurement, and correlates," Paper presented to the American Education Research Association, New Orleans, LA., April 1984. Also D. S. Honeyman and W. J. White, "Computer Anxiety in Educators Learning to Use the Computer: A Preliminary Report," Journal of Research on Computing in Education. Vol. 20, Winter 1987, pp. 129-38.

2. See R. Baumgarte, "Computer anxiety and instruction," Paper presented to Southeast Psychological Association, New Orleans. LA., Spring 1984.

3. For a few of many see E. W. Jordan and D. F. Stroup, "The behavioral antecedents of computer fear," Journal of Data Education, 1982, Vol. 22, pp. 7-8; and W. G. Powers, "The effects of prior computer exposure on man-machine computer anxiety," Paper presented to the International Communication Association, Montreal, Canada, 1973.

4. Raja R. A. Issa and Robert L. Lorentz, "Computers: Friend or Foe to the Black Educator?" Paper presented to the Southwestern Economics Association, Houston, TX, March,1988.

5. Joseph F. Hair et al., Multivariate Data Analysis, (New York: Macmillan Publishing Co., 1984), p. 103.

BIBLIOGRAPHY

Baumgarte,R. (1984). "Computer anxiety and instruction." Paper presented to the Southeast Psychological Association, New Orleans, LA., Spring 1984. (ERIC ED 252 193).

Cambre, M. A., and Cook, D. L. (1984). "Computer anxiety: Definition, measurement, and correlates. Paper presented to the American Education Research Association, New Orleans, LA., April 1984. (ERIC ED 246 085).

Hair, Joseph F. et al., Multivariate Data Analysis, (New York: Macmillan Publishing Co., 1984), p. 103.

Honeyman, D. S., and White, W. J. (1987). "Computer Anxiety in Educators Learning to Use the Computer: A Preliminary Report," Journal of Research on Computing in Education. Vol. 20, Winter 1987, pp. 129-38.

Issa, Raja R. A., and Robert L. Lorentz, "Computers: Friend or Foe to the Black Educator?" Paper presented to the Southwestern Economics Association, Houston, TX, March, 1988.

Jordan, E. W., and Stroup, D. F. (1982). "The behavioral antecedents of computer fear." Journal of Data Education. Vol. 22, pp. 7-8.

Powers, W. G. (1973). "The effects of prior computer exposure on man-machine computer anxiety." Paper presented to the International Communication Association, Montreal, Canada. (ERIC ED 089 763).